FIG.1

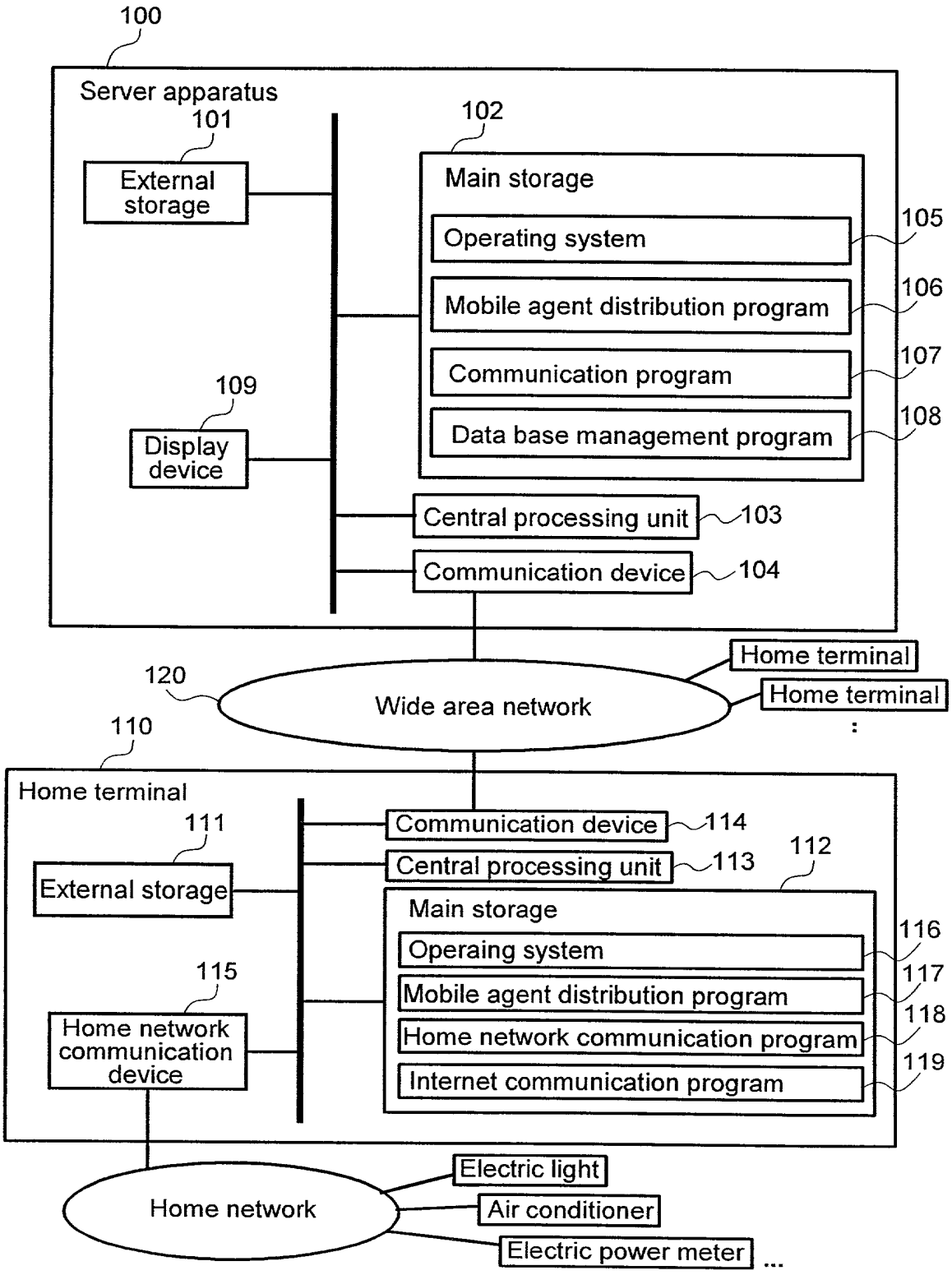

100
Server apparatus
101
External storage
102
Main storage
Operating system
105
Mobile agent distribution program
106
Communication program
107
Data base management program
108
109
Display device
Central processing unit
103
Communication device
104
120
Wide area network
Home terminal
Home terminal
:
110
Home terminal
111
External storage
Communication device
114
Central processing unit
113
112
Main storage
Operaing system
116
Mobile agent distribution program
117
Home network communication program
118
Internet communication program
119
115
Home network communication device
Home network
Electric light
Air conditioner
Electric power meter
...

FIG.2

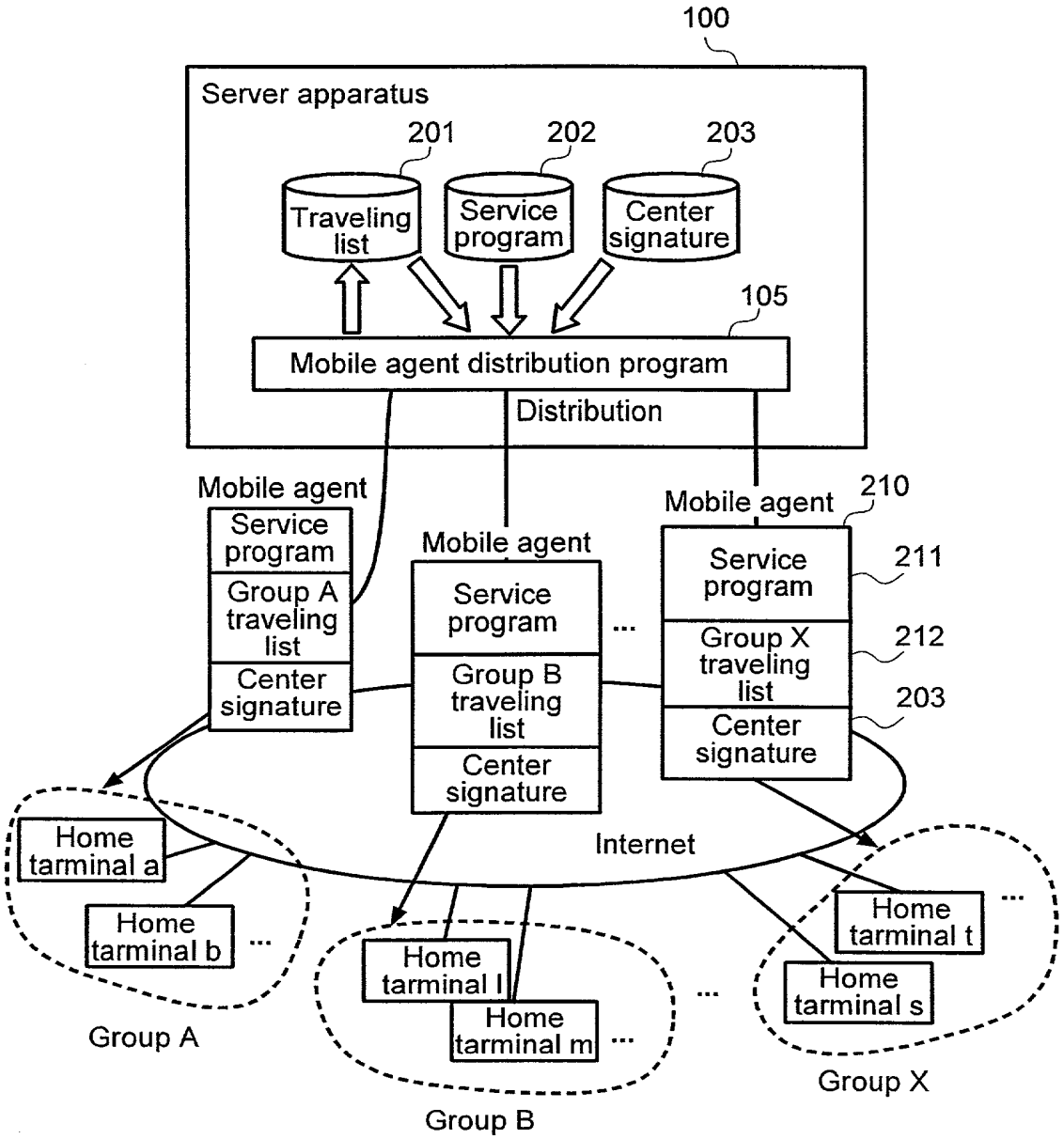

100
Server apparatus
201
202
203
Traveling list
Service program
Center signature
105
Mobile agent distribution program
Distribution
Mobile agent
Service program
Group A traveling list
Center signature
Mobile agent
Service program
Group B traveling list
Center signature
Mobile agent
210
Service program
211
Group X traveling list
212
Center signature
203
Internet
Home tarminal a
Home tarminal b
Group A
Home tarminal l
Home tarminal m
Group B
Home tarminal t
Home tarminal s
Group X

FIG.3

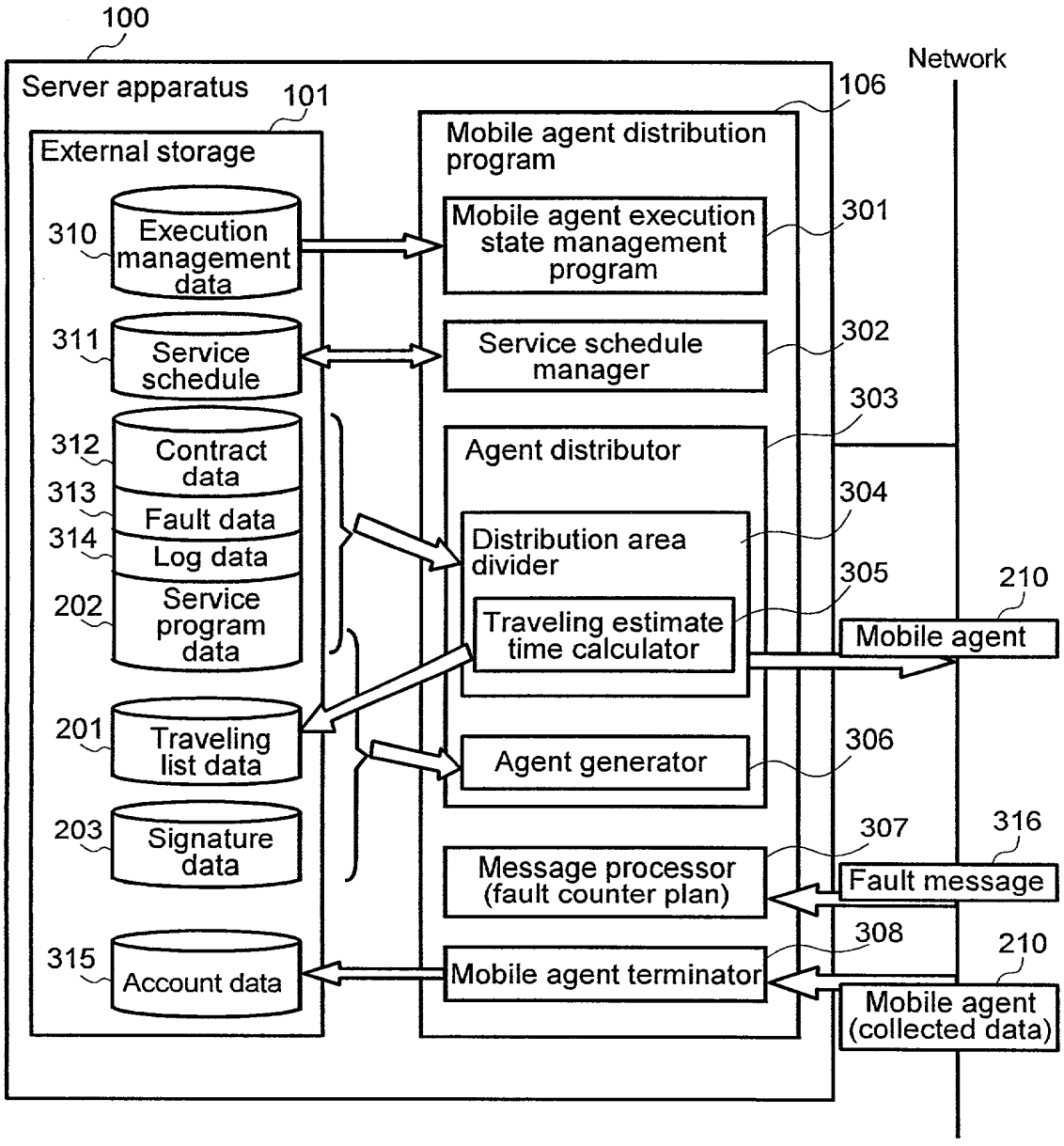

100
Server apparatus
101
External storage
310
Execution management data
311
Service schedule
312
Contract data
313
Fault data
314
Log data
202
Service program data
201
Traveling list data
203
Signature data
315
Account data
Mobile agent distribution program
106
Mobile agent execution state management program
301
Service schedule manager
302
303
Agent distributor
304
Distribution area divider
305
Traveling estimate time calculator
306
Agent generator
307
Message processor (fault counter plan)
308
Mobile agent terminator
Network
210
Mobile agent
316
Fault message
210
Mobile agent (collected data)

FIG.4

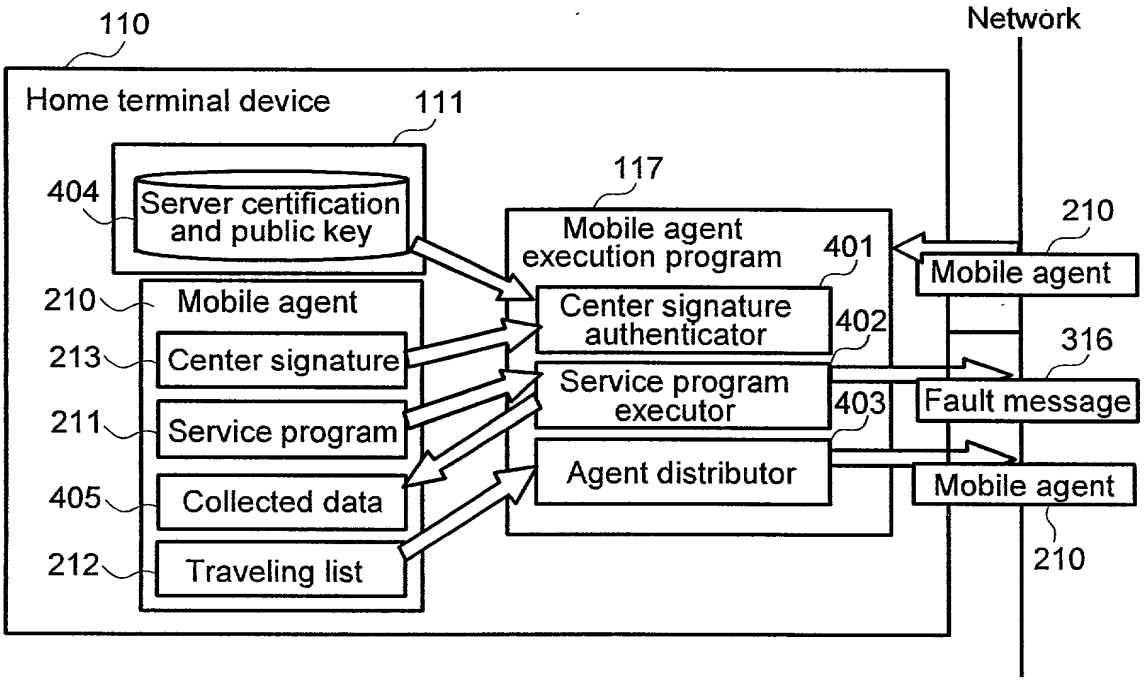

110
Network
Home terminal device
111
404
Server certification and public key
117
Mobile agent execution program
401
210
Mobile agent
210
Mobile agent
213
Center signature
Center signature authenticator
402
316
211
Service program
Service program executor
403
Fault message
405
Collected data
Agent distributor
Mobile agent
212
Traveling list
210

FIG.5

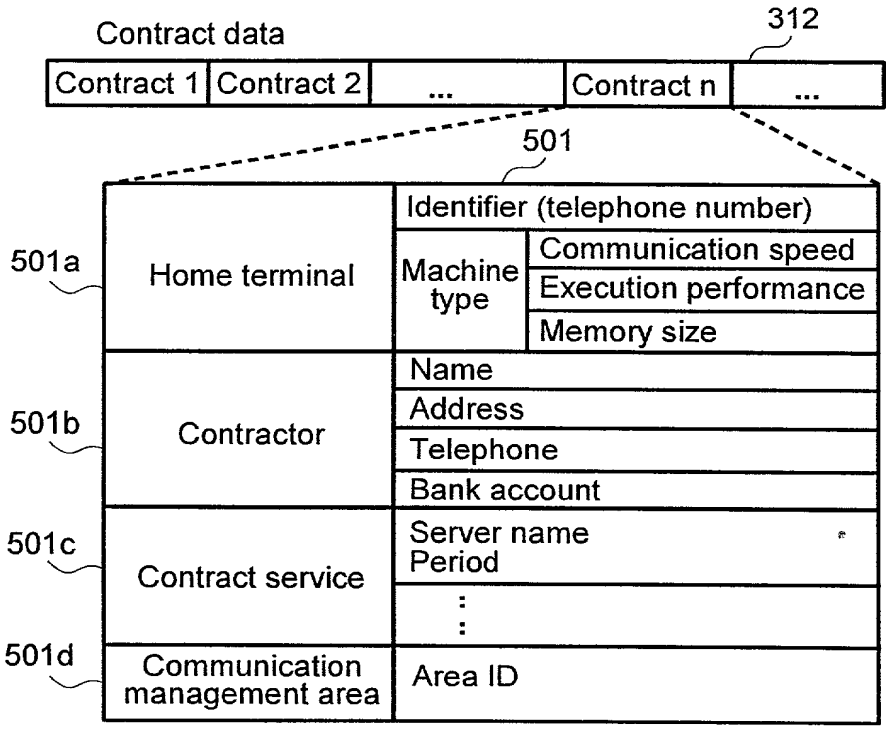

Contract data
312
Contract 1
Contract 2
...
Contract n
...
501
501a
Home terminal
Identifier (telephone number)
Machine type
Communication speed
Execution performance
Memory size
501b
Contractor
Name
Address
Telephone
Bank account
501c
Contract service
Server name
Period
501d
Communication management area
Area ID

FIG.6

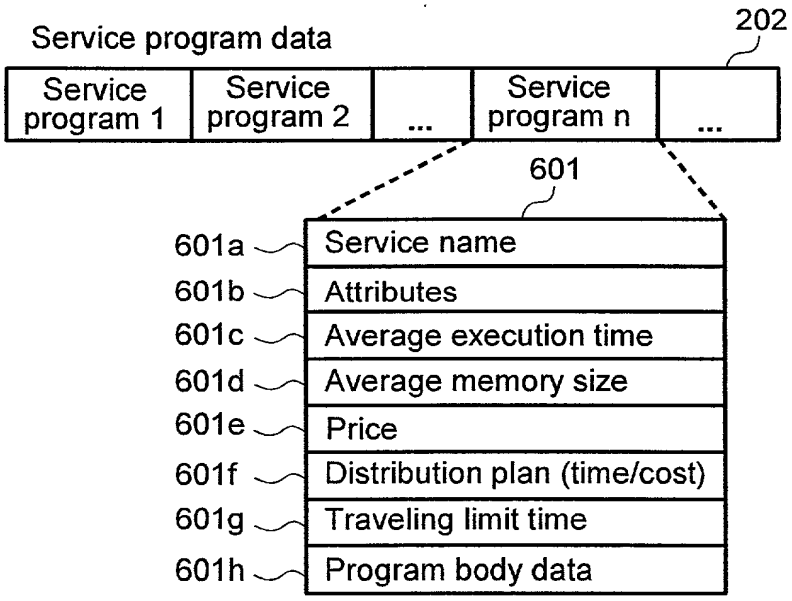


FIG.7

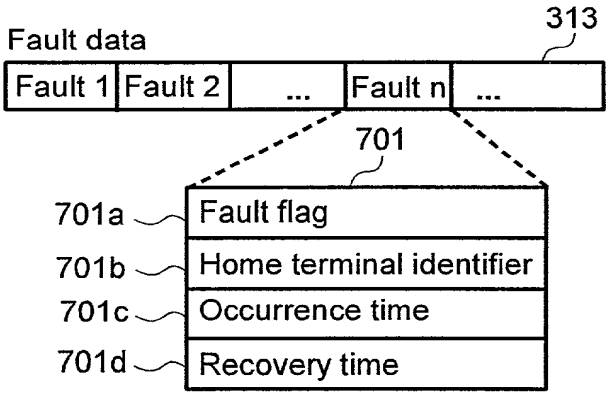


FIG.8

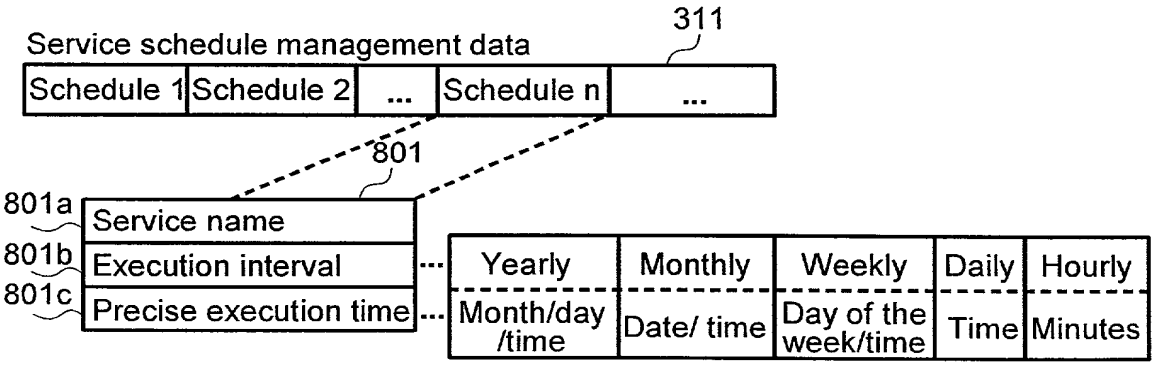


FIG.9

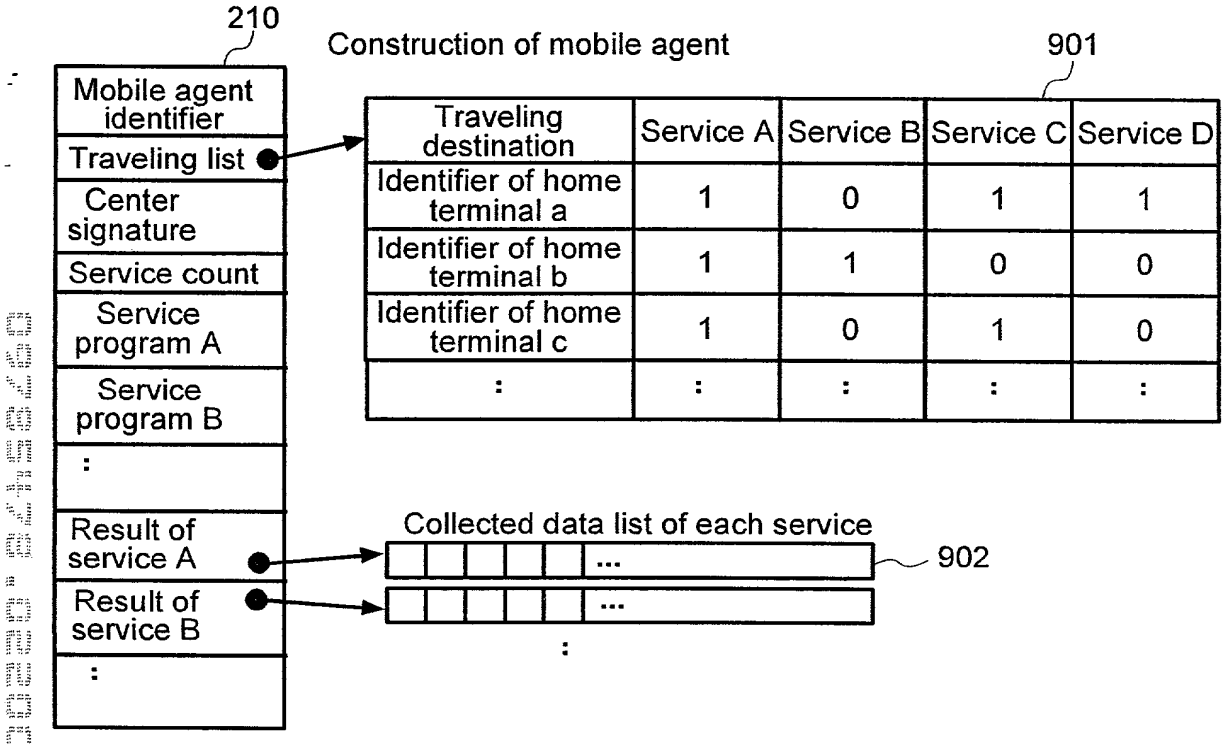

210
Construction of mobile agent
901
Mobile agent identifier
Traveling list
Center signature
Service count
Service program A
Service program B
:
Result of service A
Result of service B
:
Traveling destination
Service A
Service B
Service C
Service D
Identifier of home terminal a
1
0
1
1
Identifier of home terminal b
1
1
0
0
Identifier of home terminal c
1
0
1
0
:
:
:
:
:
Collected data list of each service
902
...
...
:

FIG.10

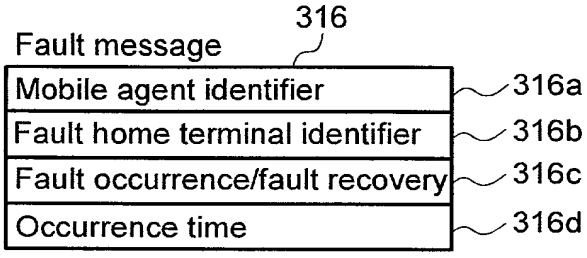

316
Fault message
Mobile agent identifier
316a
Fault home terminal identifier
316b
Fault occurrence/fault recovery
316c
Occurrence time
316d

FIG.11

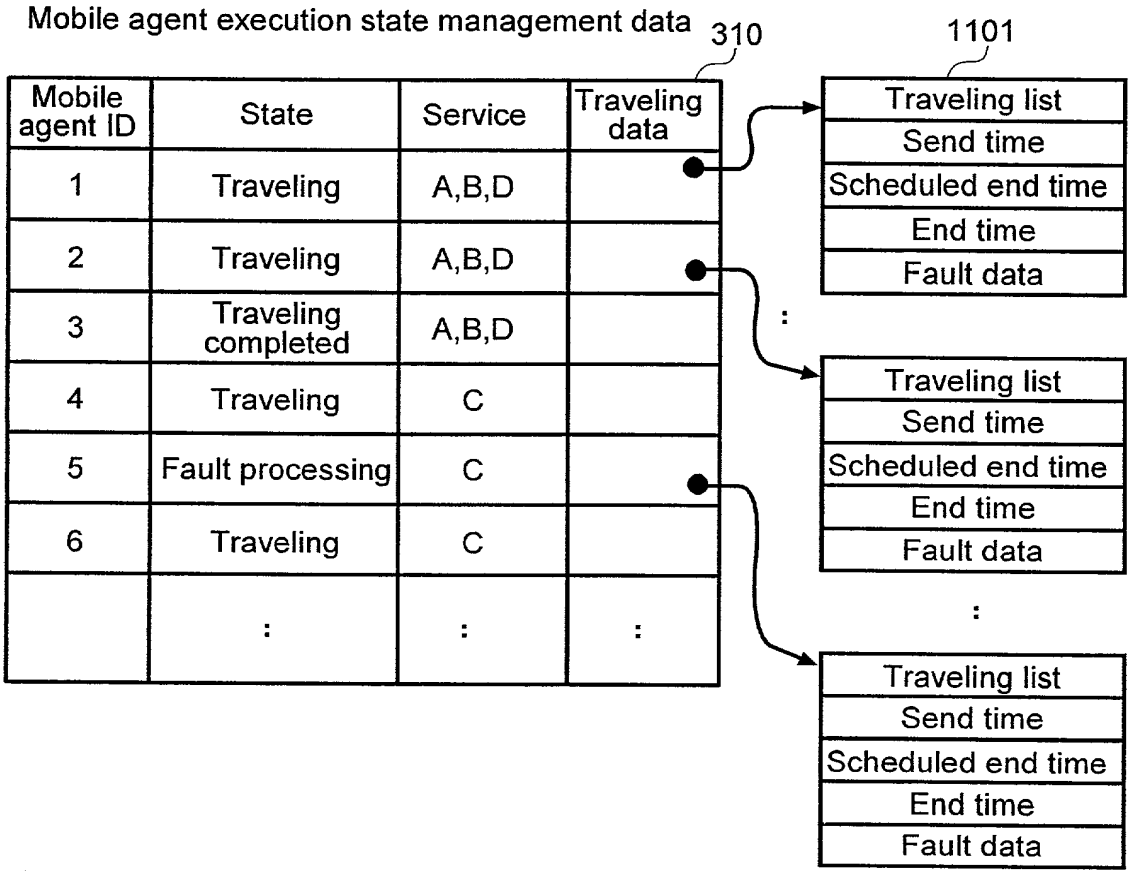

Mobile agent execution state management data
310
1101
Mobile agent ID
State
Service
Traveling data
1
Traveling
A,B,D
2
Traveling
A,B,D
3
Traveling completed
A,B,D
4
Traveling
C
5
Fault processing
C
6
Traveling
C
Traveling list
Send time
Scheduled end time
End time
Fault data
Traveling list
Send time
Scheduled end time
End time
Fault data
Traveling list
Send time
Scheduled end time
End time
Fault data

FIG.12

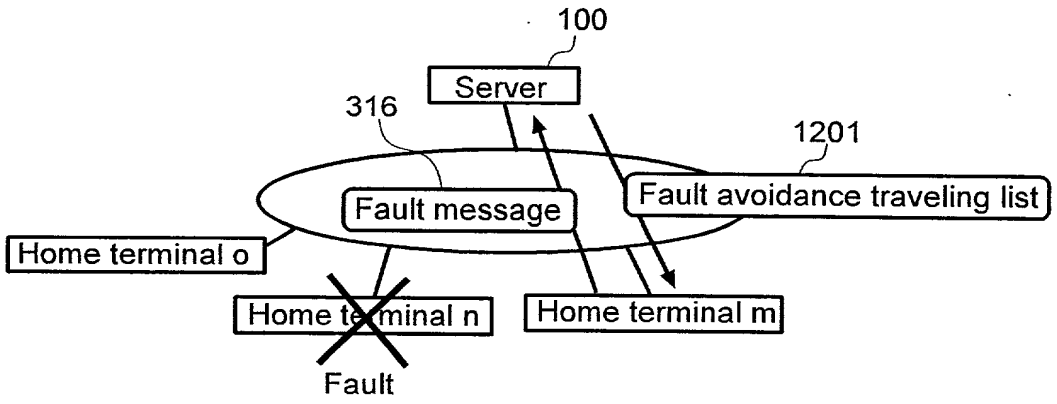

100
Server
316
1201
Fault message
Fault avoidance traveling list
Home terminal o
Home terminal n
Home terminal m
Fault

FIG.13

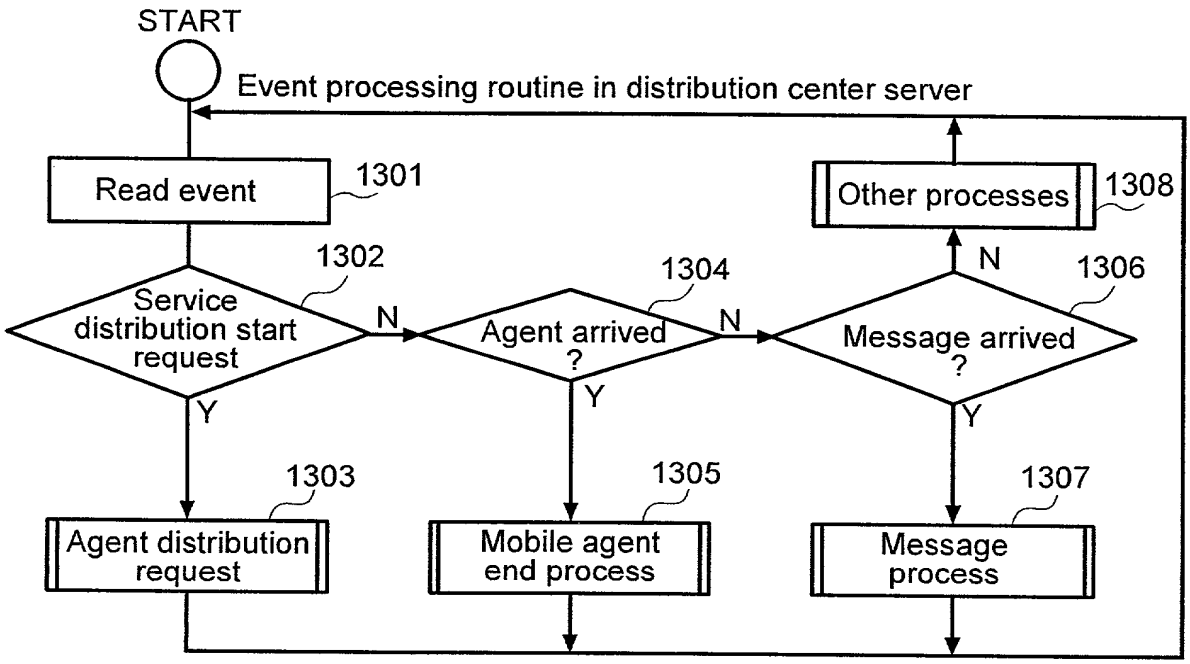

START
Event processing routine in distribution center server
Read event
1301
Service distribution start request
1302
N
Agent arrived ?
1304
N
Message arrived ?
1306
N
Other processes
1308
Y
Agent distribution request
1303
Y
Mobile agent end process
1305
Y
Message process
1307

FIG.14

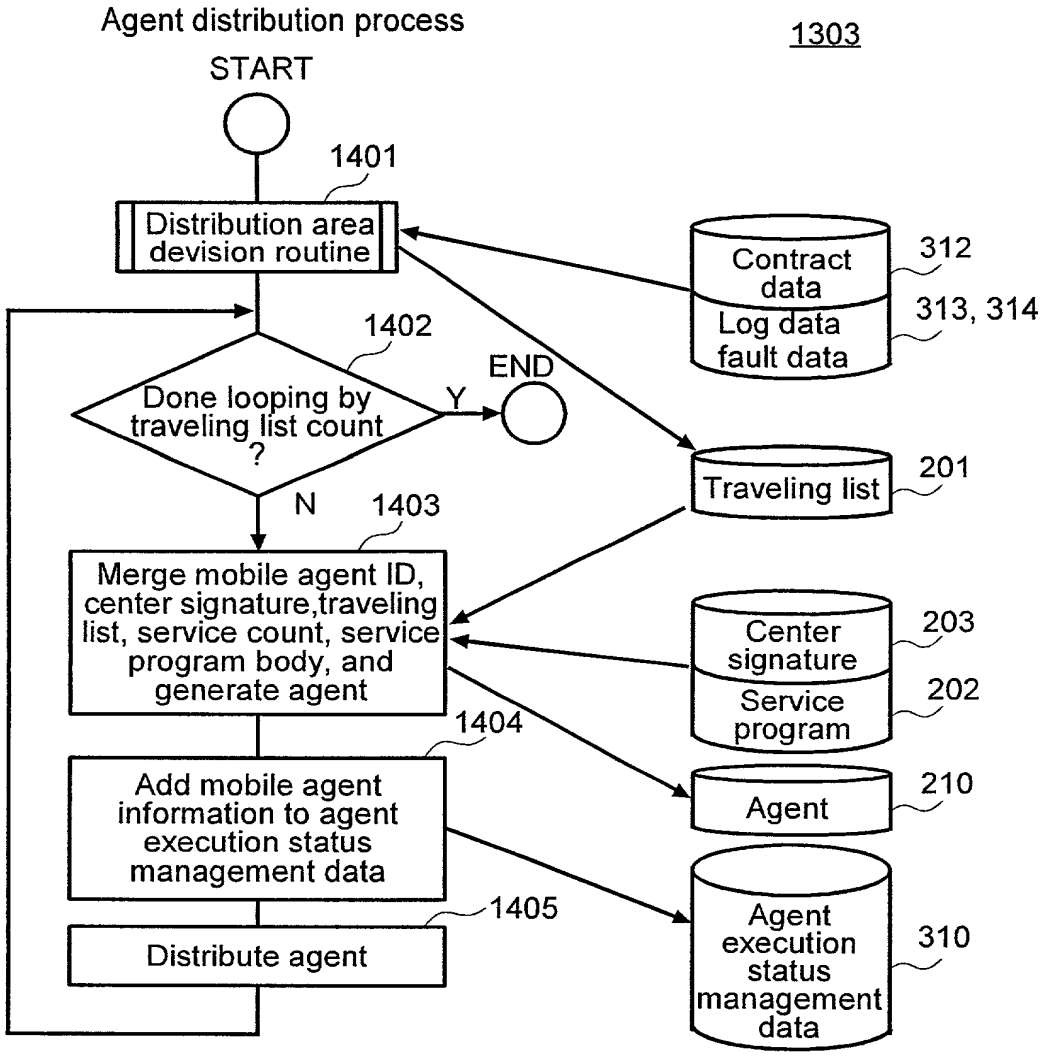

Agent distribution process
1303
START
1401
Distribution area devision routine
Contract data
312
Log data fault data
313, 314
1402
Done looping by traveling list count ?
Y
END
N
1403
Traveling list
201
Merge mobile agent ID, center signature,traveling list, service count, service program body, and generate agent
Center signature
203
Service program
202
1404
Add mobile agent information to agent execution status management data
Agent
210
1405
Distribute agent
Agent execution status management data
310

FIG.15

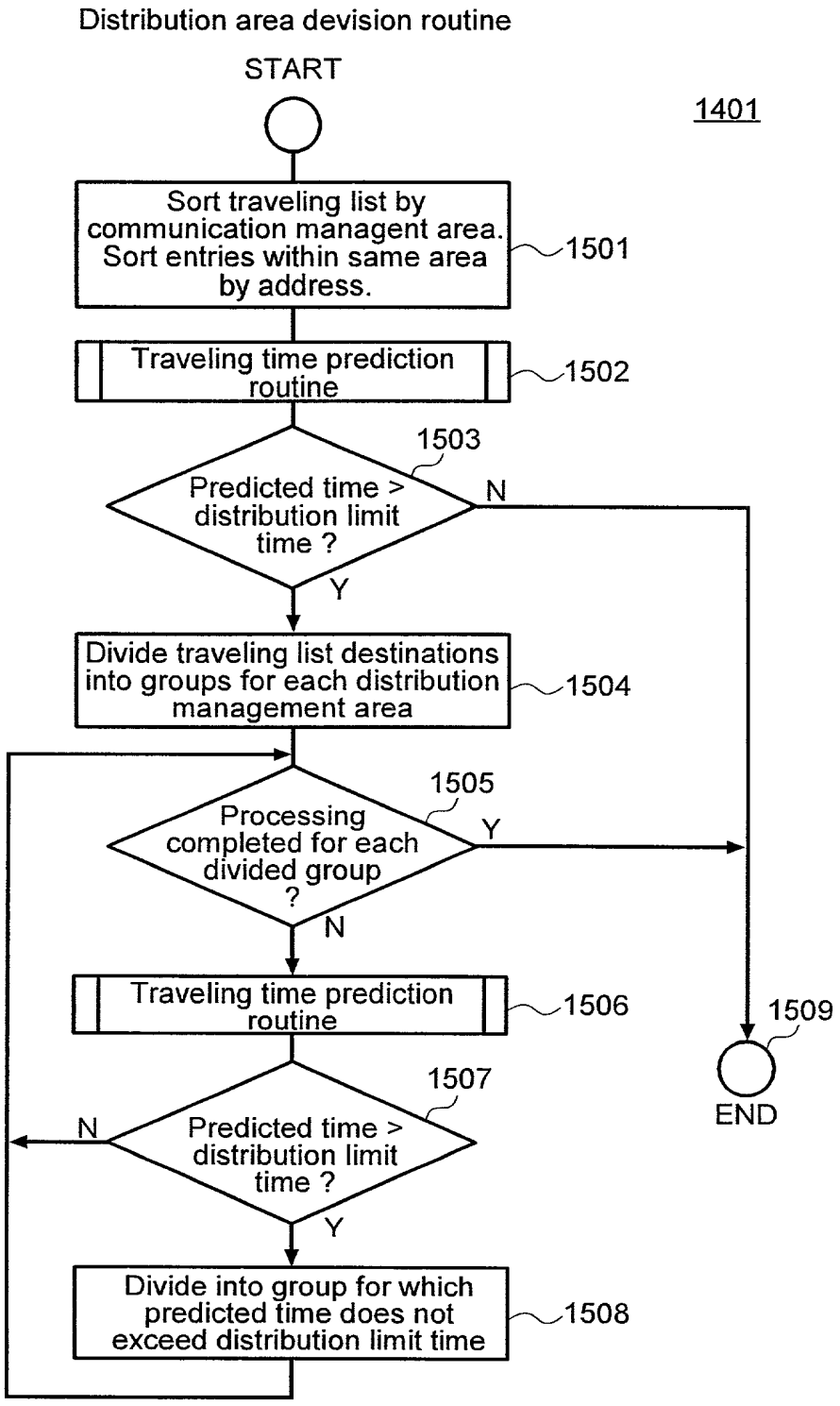

Distribution area devision routine
START
1401
Sort traveling list by communication managent area. Sort entries within same area by address.
1501
Traveling time prediction routine
1502
1503
Predicted time > distribution limit time ?
N
Y
Divide traveling list destinations into groups for each distribution management area
1504
1505
Processing completed for each divided group ?
Y
N
Traveling time prediction routine
1506
1509
END
1507
N
Predicted time > distribution limit time ?
Y
Divide into group for which predicted time does not exceed distribution limit time
1508

FIG.16

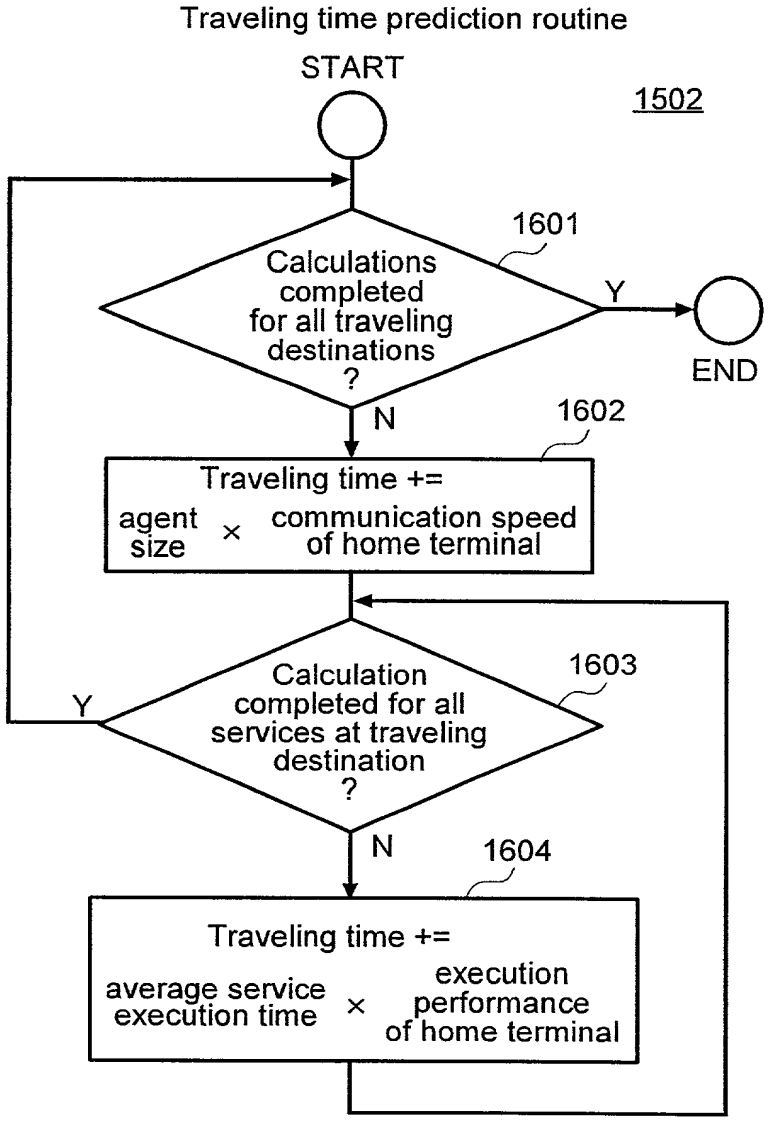

Traveling time prediction routine
START
1502
1601
Calculations completed for all traveling destinations ?
Y
END
N
1602
Traveling time += agent size × communication speed of home terminal
1603
Calculation completed for all services at traveling destination ?
Y
N
1604
Traveling time += average service execution time × execution performance of home terminal

FIG.17

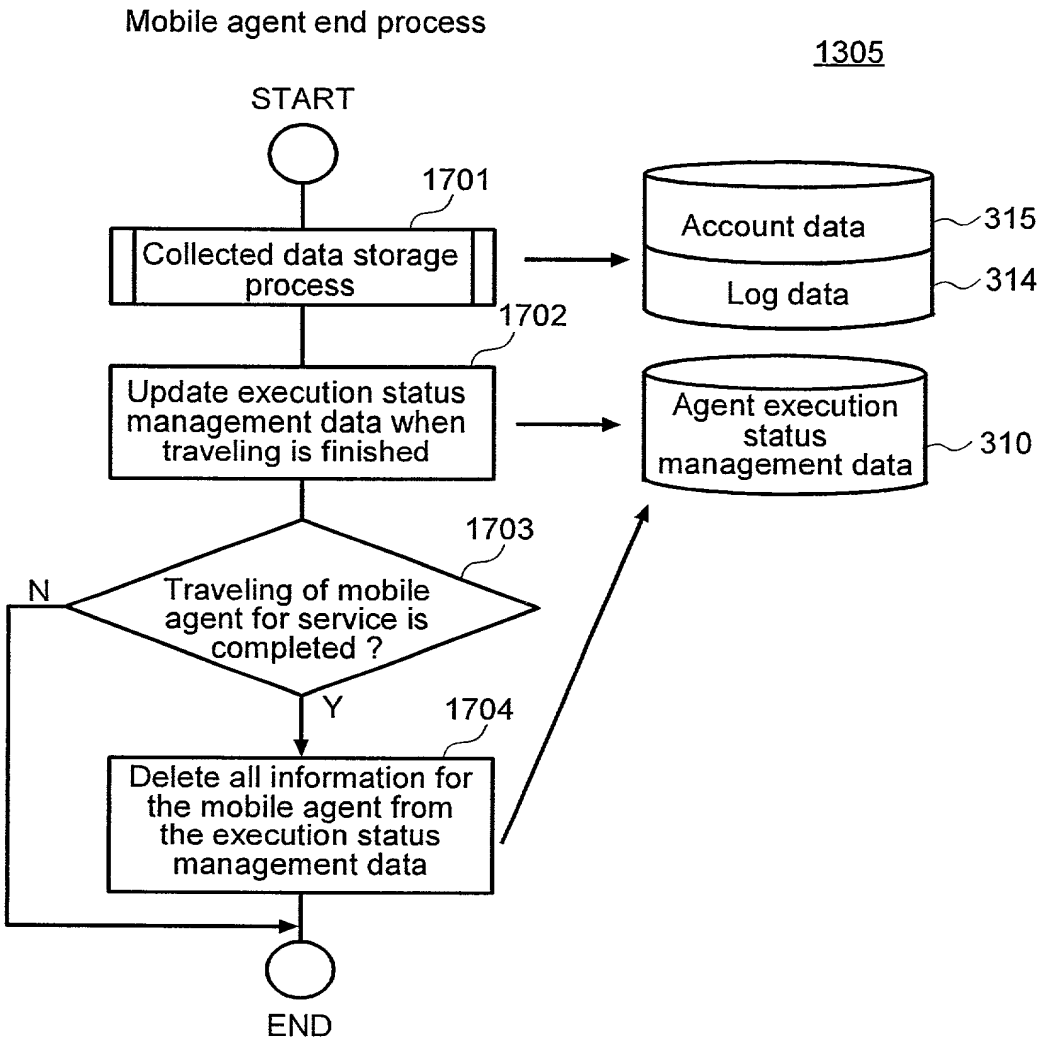

Mobile agent end process
1305
START
1701
Collected data storage process
Account data
315
Log data
314
1702
Update execution status management data when traveling is finished
Agent execution status management data
310
1703
Traveling of mobile agent for service is completed ?
N
Y
1704
Delete all information for the mobile agent from the execution status management data
END

FIG.18

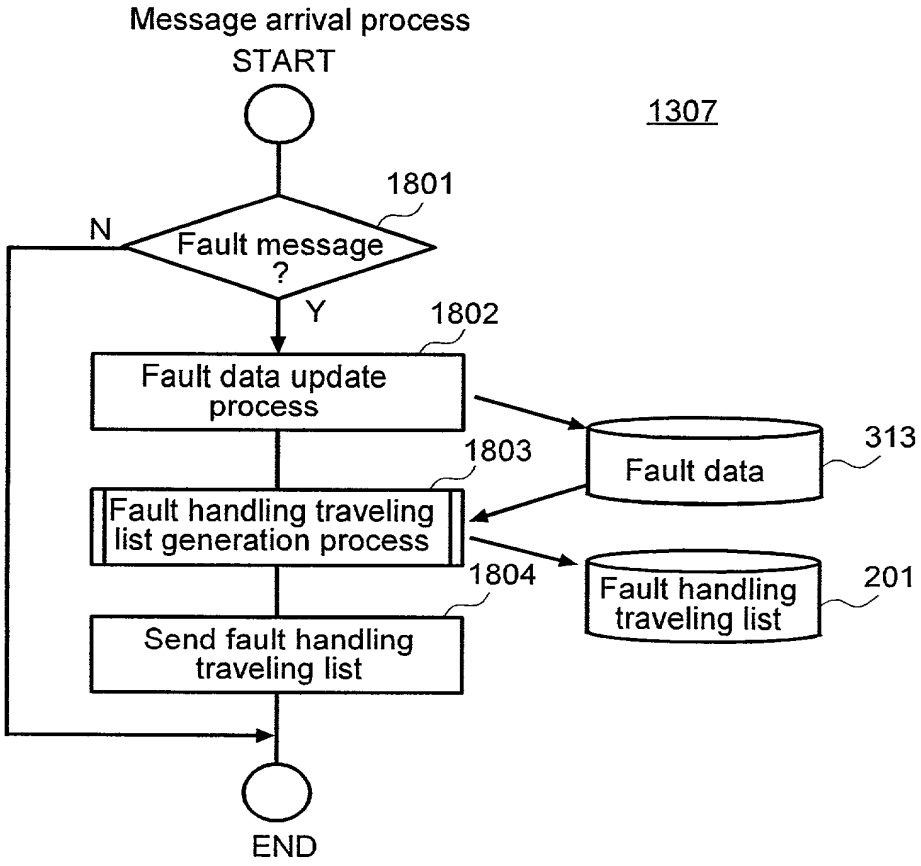

Message arrival process
START
1307
1801
N
Fault message ?
Y
1802
Fault data update process
313
Fault data
1803
Fault handling traveling list generation process
1804
201
Fault handling traveling list
Send fault handling traveling list
END

FIG.19

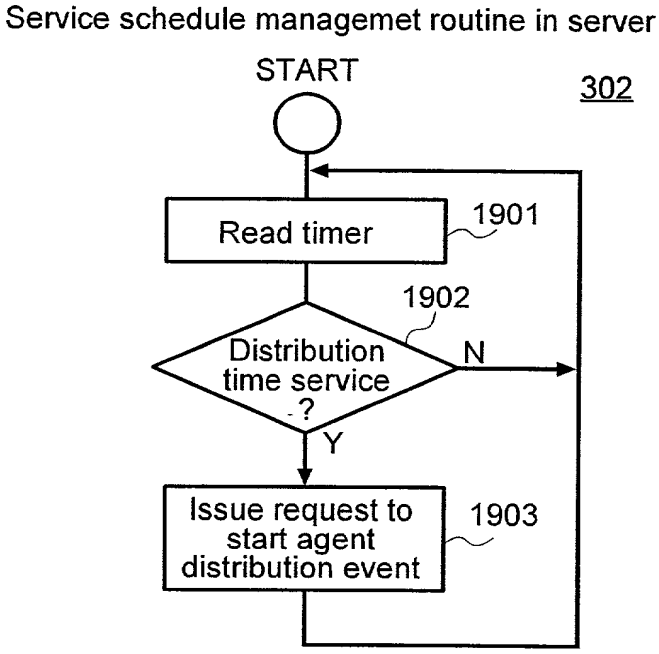

Service schedule managemet routine in server
START
302
Read timer
1901
1902
Distribution time service ?
N
Y
Issue request to start agent distribution event
1903

FIG.20

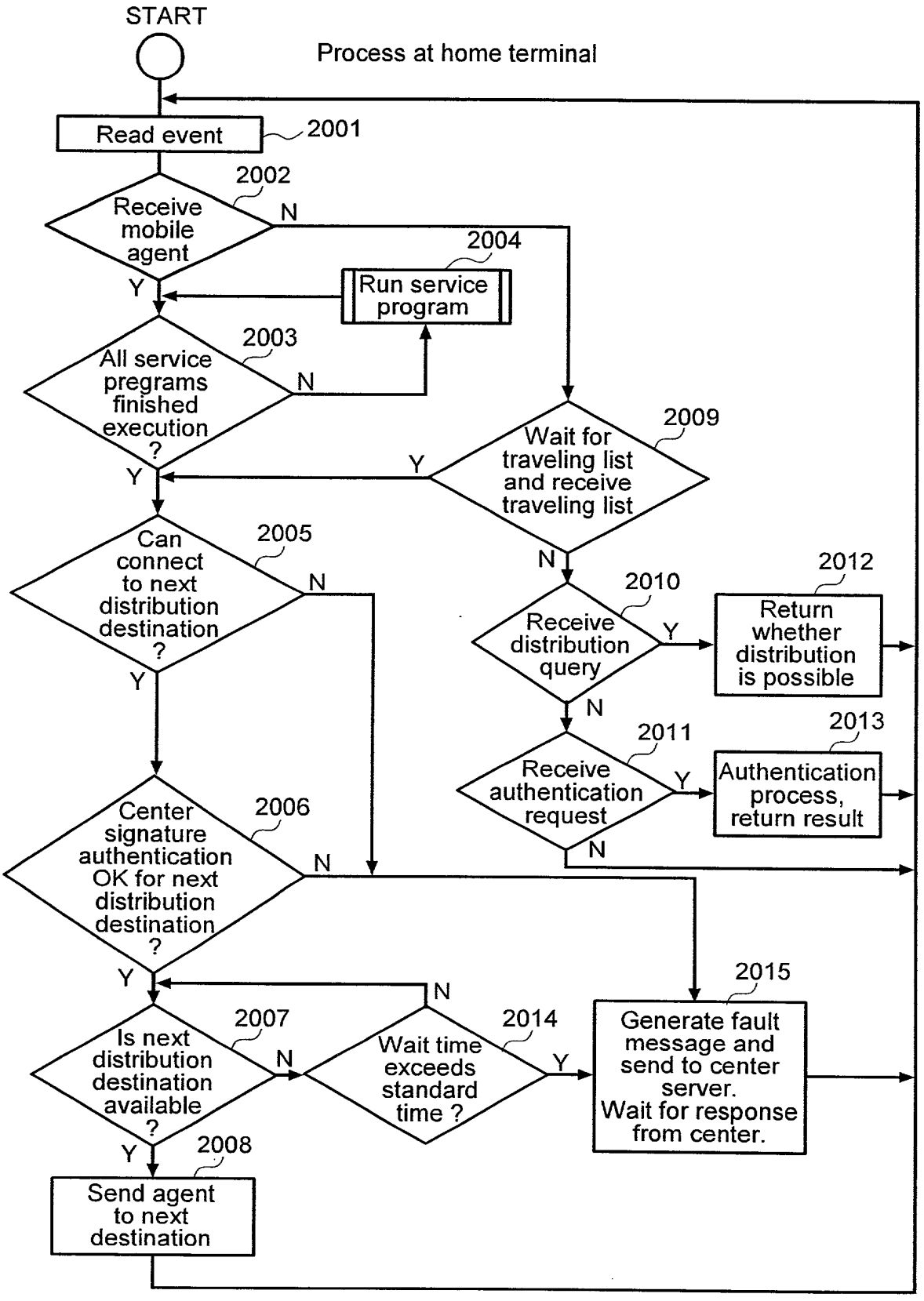

START
Process at home terminal
Read event
2001
Receive mobile agent
2002
N
Y
Run service program
2004
All service pregrams finished execution ?
2003
N
Y
Wait for traveling list and receive traveling list
2009
Y
N
Can connect to next distribution destination ?
2005
N
Y
Receive distribution query
2010
Y
Return whether distribution is possible
2012
N
Receive authentication request
2011
Y
Authentication process, return result
2013
N
Center signature authentication OK for next distribution destination ?
2006
N
Y
N
Is next distribution destination available ?
2007
N
Wait time exceeds standard time ?
2014
Y
Generate fault message and send to center server. Wait for response from center.
2015
Y
Send agent to next destination
2008

FIG.21

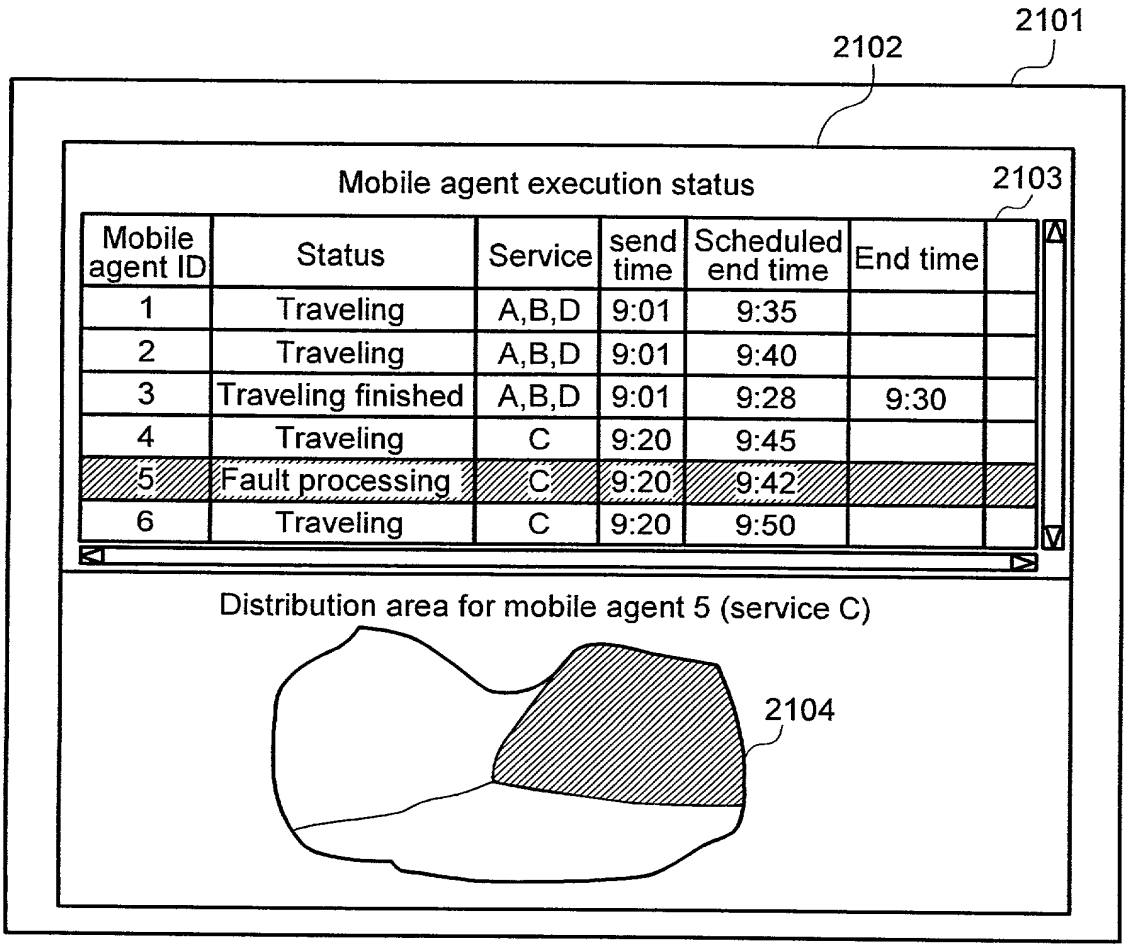
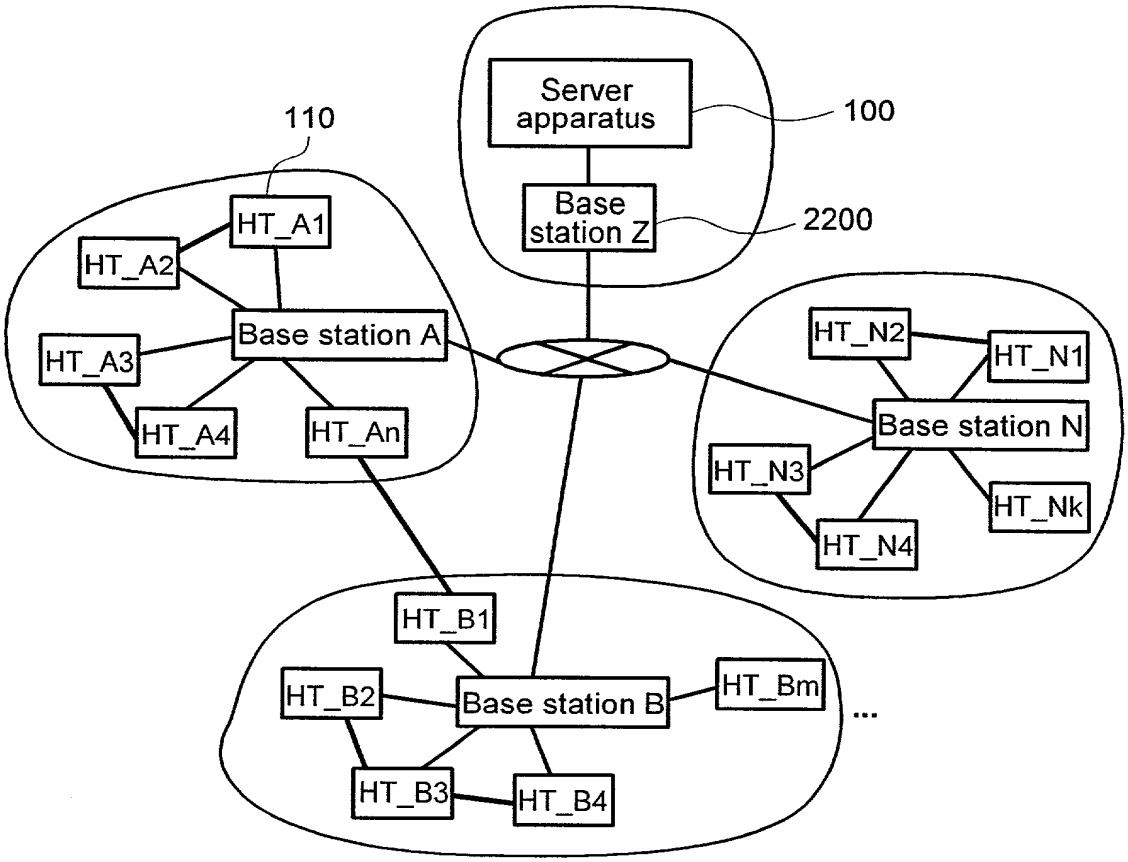

2101
2102
Mobile agent execution status
2103
Mobile agent ID
Status
Service
send time
Scheduled end time
End time
1 Traveling A,B,D 9:01 9:35
2 Traveling A,B,D 9:01 9:40
3 Traveling finished A,B,D 9:01 9:28 9:30
4 Traveling C 9:20 9:45
5 Fault processing C 9:20 9:42
6 Traveling C 9:20 9:50
Distribution area for mobile agent 5 (service C)
2104

FIG.22



HT= home terminal

FIG.23

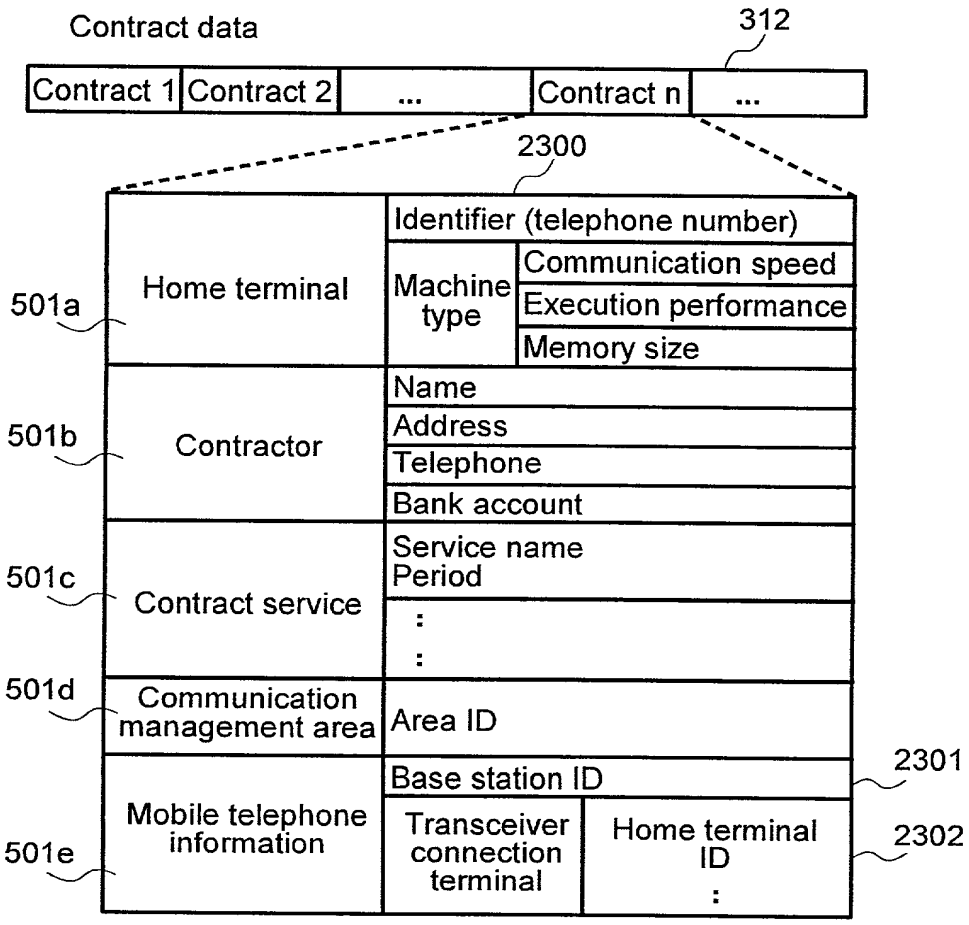

Contract data
312
Contract 1
Contract 2
...
Contract n
...
2300
Home terminal
Identifier (telephone number)
Machine type
Communication speed
Execution performance
Memory size
501a
Contractor
Name
Address
Telephone
Bank account
501b
Contract service
Service name
Period
:
:
501c
Communication management area
Area ID
501d
Mobile telephone information
Base station ID
2301
Transceiver connection terminal
Home terminal ID
:
2302
501e

FIG.24

Transceiver mode connection group table

2400

Group	home terminal list (2401)	Base station (2402)
1	HT_A1	A
	HT_A2	A
	HT_A3	A
	HT_A4	A
	HT_B1	B
	HT_B2	B
2	HT_A5	A
	HT_A6	A
	HT_A7	A
	HT_A8	A
	HT_C7	C
	HT_C6	C
3	HT_B3	B
	:	
4	HT_B4	B
	HT_B5	B
	HT_B6	B
	HT_C2	C
	HT_C1	C
	HT_C3	C
5	HT_C4	C
	HT_C5	C
	:	
:	:	:

HT= home terminal

FIG.25

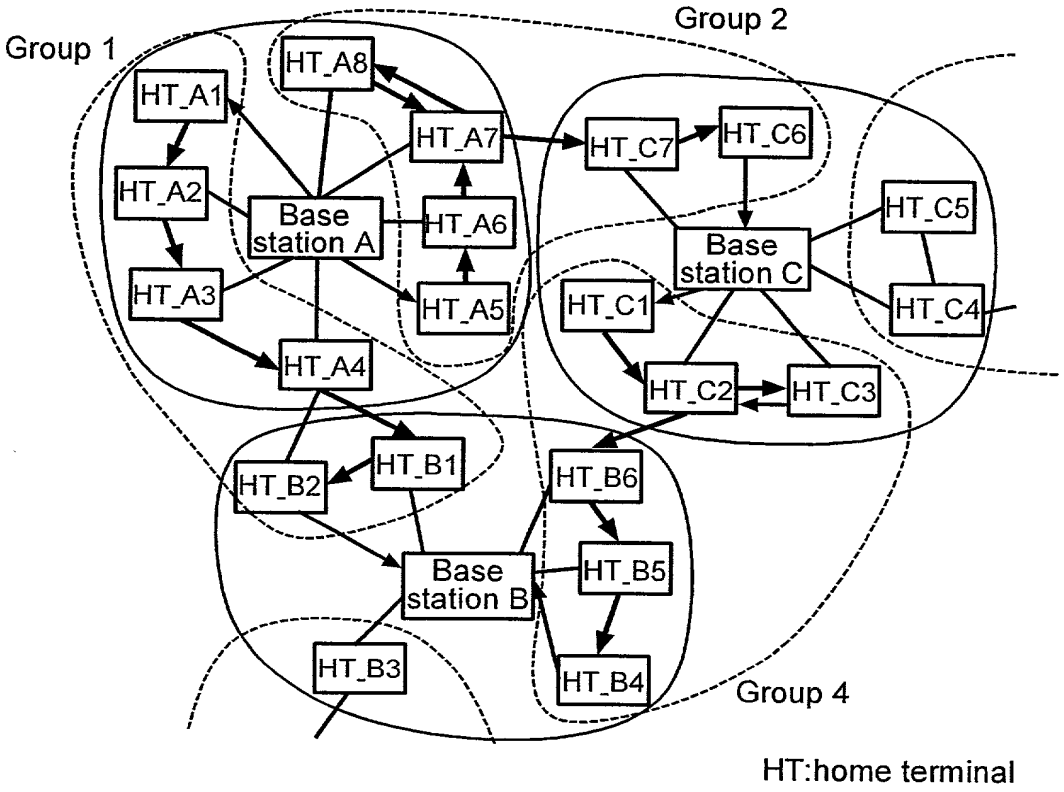

Group 1
Group 2
Group 4
HT_A1
HT_A2
HT_A3
HT_A4
HT_A5
HT_A6
HT_A7
HT_A8
Base station A
HT_B1
HT_B2
HT_B3
HT_B4
HT_B5
HT_B6
Base station B
HT_C1
HT_C2
HT_C3
HT_C4
HT_C5
HT_C6
HT_C7
Base station C
HT:home terminal

FIG.26

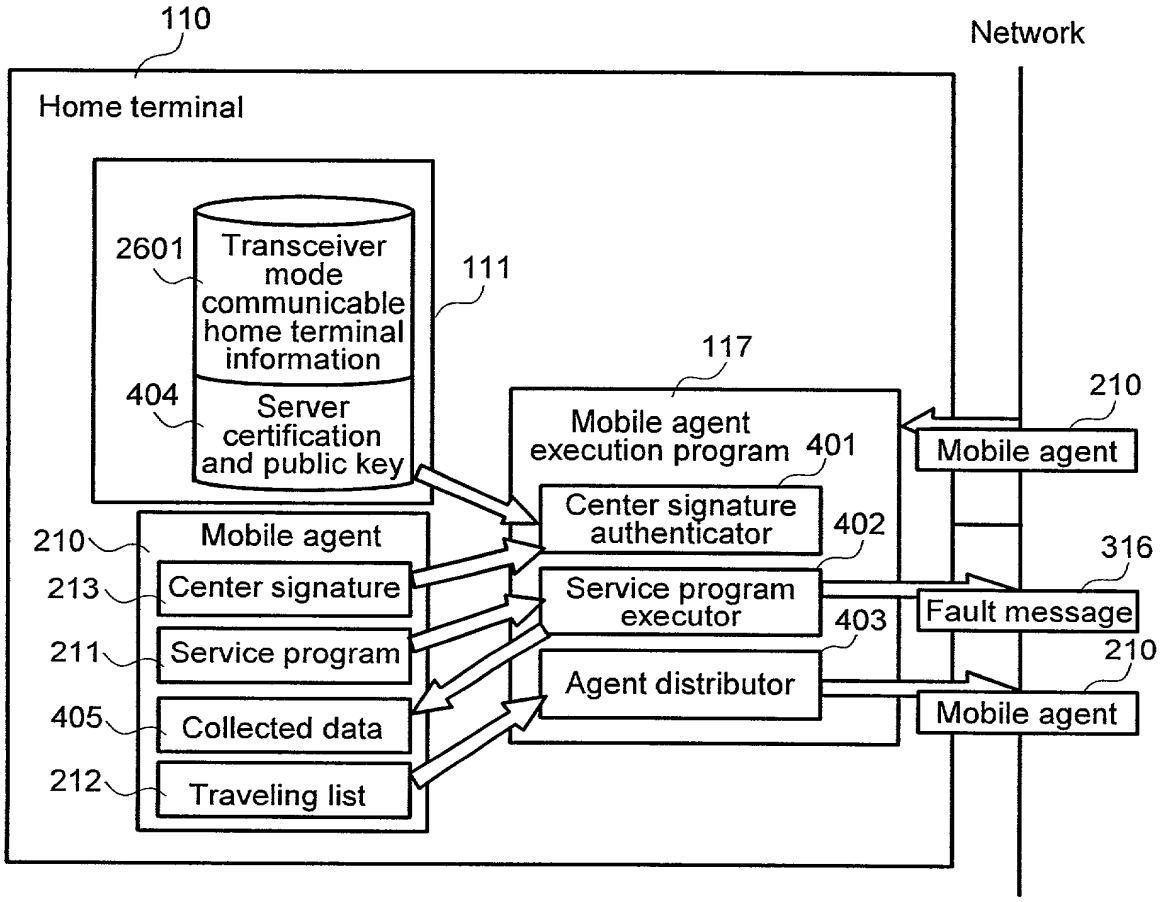

110
Network
Home terminal
2601
Transceiver mode communicable home terminal information
111
404
Server certification and public key
117
Mobile agent execution program
401
Center signature authenticator
402
Service program executor
403
Agent distributor
210
Mobile agent
316
Fault message
210
Mobile agent
210
Mobile agent
213
Center signature
211
Service program
405
Collected data
212
Traveling list

FIG.27

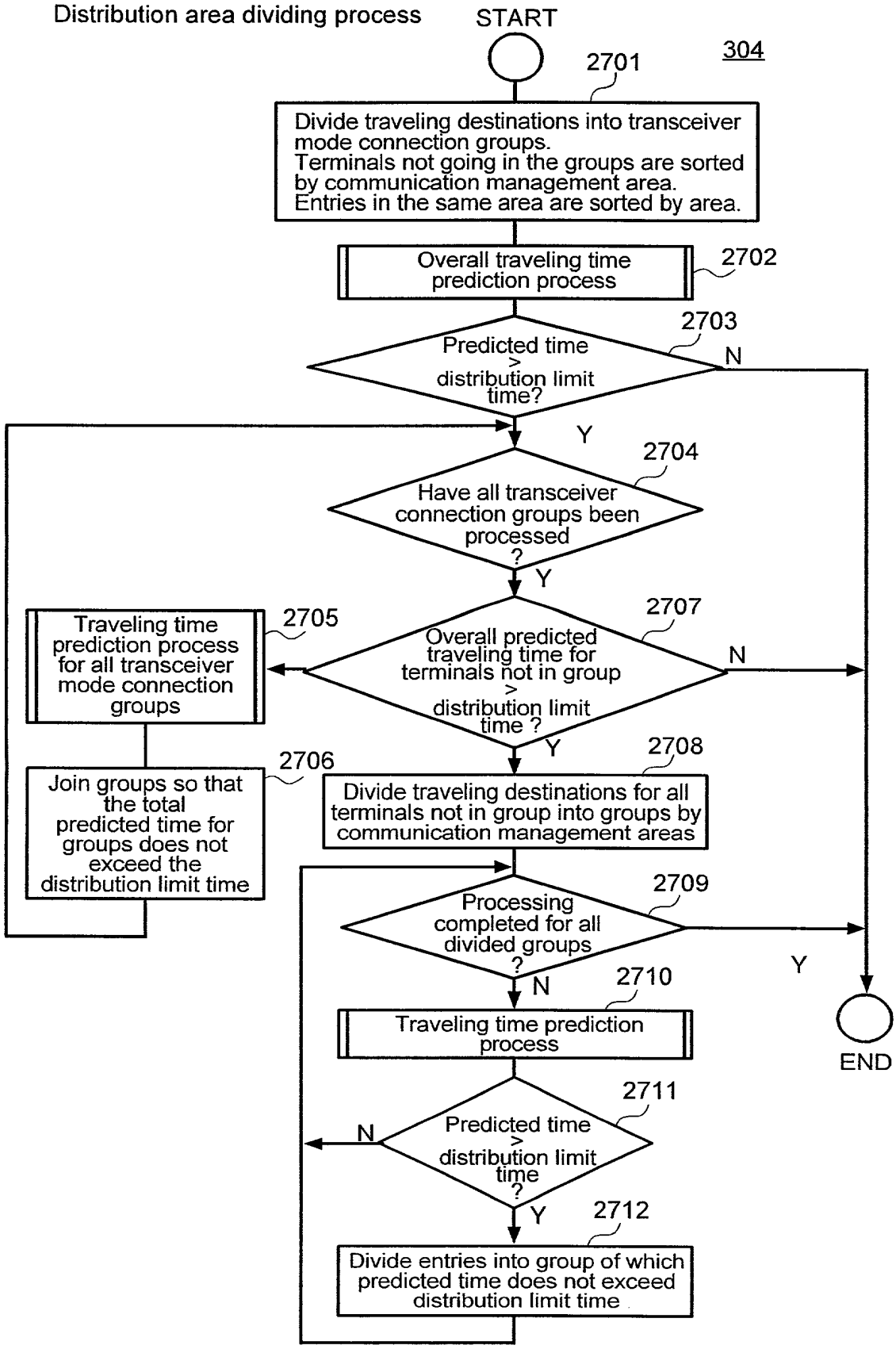

Distribution area dividing process
START
304
2701
Divide traveling destinations into transceiver mode connection groups.
Terminals not going in the groups are sorted by communication management area.
Entries in the same area are sorted by area.
Overall traveling time prediction process
2702
2703
Predicted time > distribution limit time?
N
Y
2704
Have all transceiver connection groups been processed ?
Y
2707
Overall predicted traveling time for terminals not in group > distribution limit time ?
N
Y
2705
Traveling time prediction process for all transceiver mode connection groups
2706
Join groups so that the total predicted time for groups does not exceed the distribution limit time
2708
Divide traveling destinations for all terminals not in group into groups by communication management areas
2709
Processing completed for all divided groups ?
Y
N
2710
Traveling time prediction process
END
2711
Predicted time > distribution limit time ?
N
Y
2712
Divide entries into group of which predicted time does not exceed distribution limit time

FIG.28

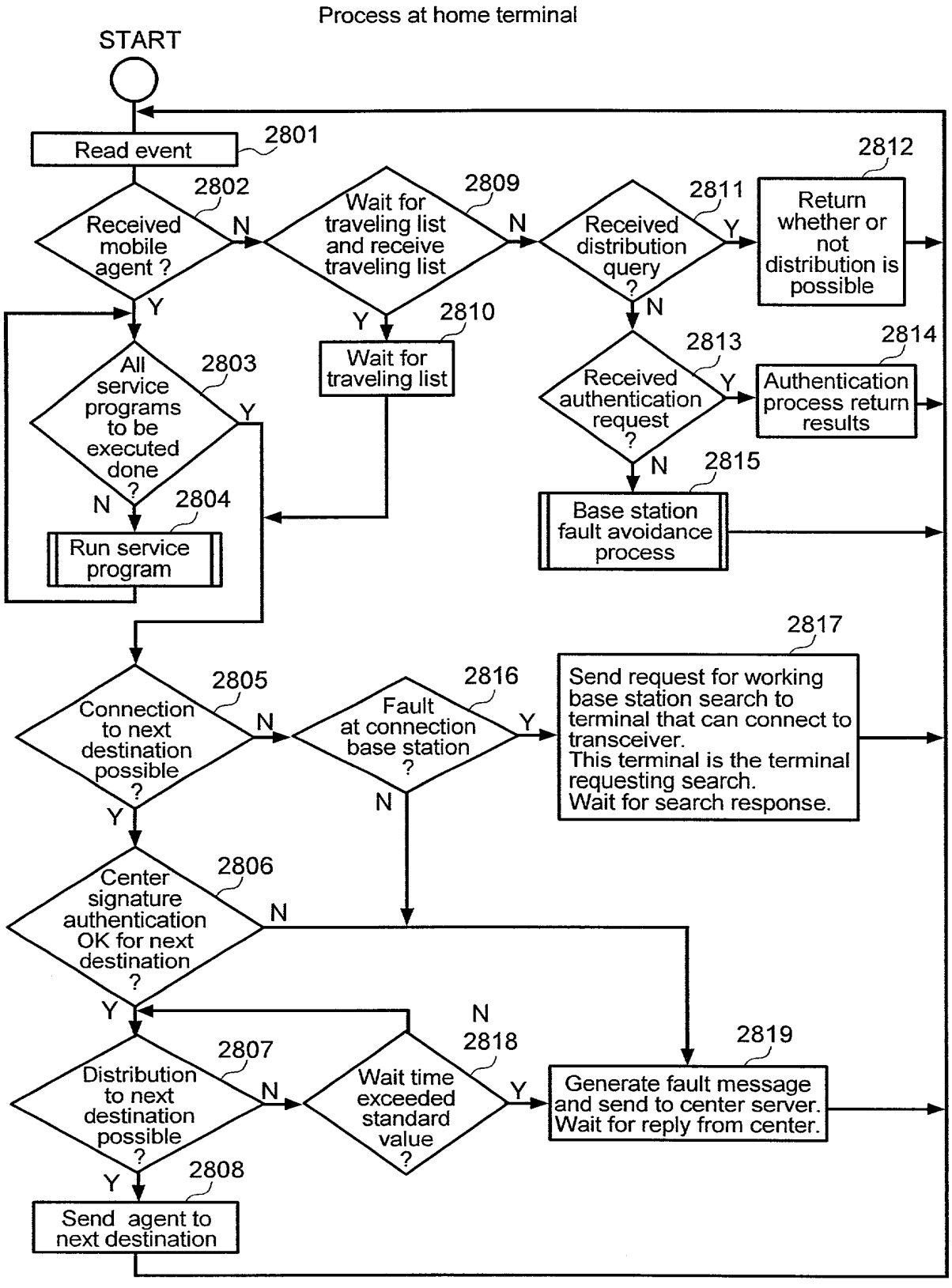
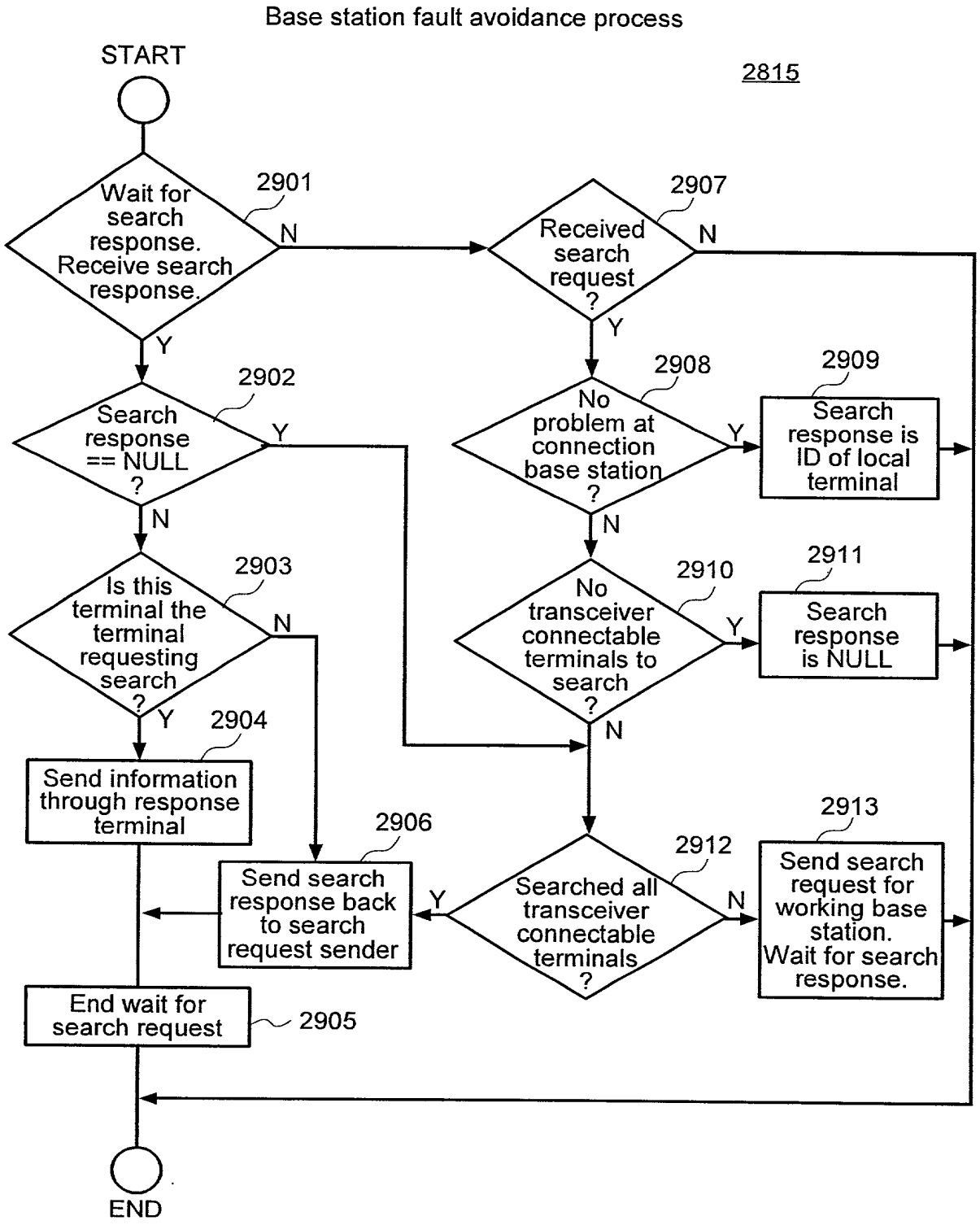

Process at home terminal
START
Read event
2801
Received mobile agent ?
2802
N
Y
Wait for traveling list and receive traveling list
2809
N
Y
Received distribution query ?
2811
Y
N
Return whether or not distribution is possible
2812
Wait for traveling list
2810
All service programs to be executed done ?
2803
Y
N
Run service program
2804
Received authentication request ?
2813
Y
N
Authentication process return results
2814
Base station fault avoidance process
2815
Connection to next destination possible ?
2805
N
Y
Fault at connection base station ?
2816
Y
N
Send request for working base station search to terminal that can connect to transceiver.
This terminal is the terminal requesting search.
Wait for search response.
2817
Center signature authentication OK for next destination ?
2806
N
Y
Distribution to next destination possible ?
2807
N
Y
Wait time exceeded standard value ?
N
2818
Y
Generate fault message and send to center server.
Wait for reply from center.
2819
Send agent to next destination
2808

FIG.29


Base station fault avoidance process
START
2815
Wait for search response. Receive search response.
2901
N
Y
Received search request ?
2907
N
Y
Search response == NULL ?
2902
Y
N
No problem at connection base station ?
2908
Y
Search response is ID of local terminal
2909
N
Is this terminal the terminal requesting search ?
2903
N
Y
No transceiver connectable terminals to search ?
2910
Y
Search response is NULL
2911
N
Send information through response terminal
2904
Send search response back to search request sender
2906
Searched all transceiver connectable terminals ?
2912
Y
N
Send search request for working base station. Wait for search response.
2913
End wait for search request
2905
END